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Mr. Robert J. Sydney
General Counsel
Division of Energy Resources
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Suite 1020
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July 14, 2006

Subject: Babcock & Wilcox Comments to the proposed revisions to the Guideline on RPS Eligibility of Biomass Generation Units

Dear Mr. Sydney,

The Babcock & Wilcox Company has been in the boiler and environmental equipment business for nearly 140 years. We are a full scope supplier to the biomass market segment, offering a complete line of products, which include Fluidized Bed Boilers, Stoker Boilers, Over Fire Air Systems, and SCR systems, and have supplied SNCR via sublet vendors as part of larger projects. It is an important distinction to note that since we offer all these products, we not only have a wealth of design and operating experience, but our comments should be viewed as unbiased toward any particular technology.

While we agree in principle with the philosophy that guidelines should remain “technology neutral”, it is simply a fact that there has been an evolution in biomass combustion technology over time, which needs to be recognized.

The first biomass fired boilers were stationary grates and were hand “stoked” by operators, hence the term “stoker”. The next major development was the traveling grate, which automated the process of fuel feed and ash removal. The most recent significant development in grate technology was the water-cooled grate, which was commercialized over twenty years ago.

Fluid Bed Boilers were a step change in the technology development for combustion of fuels such as biomass. Fluid Bed technology has been commercially available for both industrial and utility applications for over twenty years now, and has been subject to a number of design improvements since the early units were put into service, with enhancements continuing to this day.

There are two main distinctions of the BFB process over the grate; the large mass of the bed and the measurement of the primary combustion zone temperature. The grate technology relies on the high mid zone flue gas temperature to ignite the incoming fuel (high radiation back to the grate). The mass of the bed in a BFB is the ignition source of the incoming fuel, which decouples the upper furnace function from the primary combustion. The bed temperature is directly related to the amount of heat release in the primary combustion zone and it is easily controlled due to the large mass of the bed. That is, the change of bed temperature is quite slow due to the large bed mass, which allows for automatic control. The combination of the bed ignition source and the direct measurement of the primary zone heat release allows for much lower primary combustion zone stoichiometry, regardless of the firing rate or boiler load. The BFB operates as low as 35% of theoretical air in the primary combustion zone as compared to about +/- 60% for a grate.

Operating the bed at lower bed stoichiometry reduces uncontrolled NOx (direct relationship) and provides larger over fire air system because more air is shifted to the mid furnace. Most of the combustion occurs in the mid to upper furnace for a deeply staged biomass fired BFB, so the larger over fire air system simply places the air where the combustion occurs. It could be called an “advanced over fire air system”, but it is simply a direct result of the design of a BFB.

CO emissions from a BFB are lower, more controllable and significantly more steady state. The key to low CO is good fluidization, uniform distribution of fuel over the bed and high velocity over fire air nozzles for mixing. The bed fluidization provides constant movement of the fuel within the primary combustion zone, which constantly exposes the fuel particle to the ignition source and air. The uniform fuel distribution over the bed places the fuel to the air. That is, place the fuel to where the air is flowing.

Is the stoker combustion an “advanced biomass power conversion technology”? With an improved over fire air system, the stoker operation and performance are improved or simply returned to where the technology should have been all along, but certainly it is not the advanced technology of the BFB combustion process.

If asked to choose one technology over another as being “advanced”, one would have to choose fluid bed technology, based upon ongoing technology development that continues to this day, as well as the superior performance of a BFB, as evidenced by better combustion efficiency resulting from comparatively lower UBC, and lower uncontrolled emissions.

In conclusion, while we do not have access to all the data required to determine a specific net heat rate for a given plant, we agree in principle that if a heat rate standard is used, then built into the guideline should be recognition that there is inherently more parasitic load with BFBs, due to the high pressure fluidizing air fan which is inherent to the technology. DOER has attempted to address this issue in the draft guidelines, and we applaud that initiative. If such an adjustment is not recognized, the guidelines will favor Stoker technology in lieu of Fluidized Bed, which would appear to defeat the intent of the guideline as it relates to the low emission, advanced biomass power conversion criteria.

Respectfully submitted

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